Sources of Additional Information
Information on careers in health information technology, including a list of CAAHEP-accredited programs is available from:
☛ American Health Information Management Association, 233 N. Michigan Ave., Suite 2150, Chicago, IL 60601. Internet: **http://www.ahima.org**

Licensed Practical Nurses

(O*NET 32505)

Significant Points

- Training lasting about 1 year is available in about 1,100 State-approved programs, mostly in vocational or technical schools.
- Nursing homes will offer the most new jobs. Jobseekers in hospitals may face competition.

Nature of the Work
Licensed practical nurses (L.P.N.s), or licensed vocational nurses as they are called in Texas and California, care for the sick, injured, convalescent, and disabled under the direction of physicians and registered nurses. (The work of registered nurses is described elsewhere in the *Handbook*.)

Most L.P.N.s provide basic bedside care. They take vital signs such as temperature, blood pressure, pulse, and respiration. They also treat bedsores, prepare and give injections and enemas, apply dressings, give alcohol rubs and massages, apply ice packs and hot water bottles, and insert catheters. L.P.N's observe patients and report adverse reactions to medications or treatments. They collect samples from patients for testing, perform routine laboratory tests, feed them, and record food and liquid intake and output. They help patients with bathing, dressing, and personal hygiene, keep them comfortable, and care for their emotional needs. In States where the law allows, they may administer prescribed medicines or start intravenous fluids. Some L.P.N.s help deliver, care for, and feed infants. Some experienced L.P.N.s supervise nursing assistants and aides.

L.P.N.s in nursing homes, in addition to providing routine bedside care, may also help evaluate residents' needs, develop care plans, and supervise the care provided by nursing aides. In doctors' offices and clinics, they may also make appointments, keep records, and perform other clerical duties. L.P.N.s who work in private homes may also prepare meals and teach family members simple nursing tasks.

Many licensed practical nurses work nights and weekends.

Working Conditions
Most licensed practical nurses in hospitals and nursing homes work a 40-hour week, but because patients need round-the-clock care, some work nights, weekends, and holidays. They often stand for long periods and help patients move in bed, stand, or walk.

L.P.N.s may face hazards from caustic chemicals, radiation, and infectious diseases such as hepatitis. They are subject to back injuries when moving patients and shock from electrical equipment. They often must deal with the stress of heavy workloads. In addition, the patients they care for may be confused, irrational, agitated, or uncooperative.

Employment
Licensed practical nurses held about 692,000 jobs in 1998. Thirty-two percent of L.P.N.s worked in hospitals, 28 percent worked in nursing homes, and 14 percent in doctors' offices and clinics. Others worked for temporary help agencies, home health care services, residential care facilities, schools, or government agencies. About 1 in 4 worked part time.

Training, Other Qualifications, and Advancement
All States require L.P.N.s to pass a licensing examination after completing a State-approved practical nursing program. A high school diploma is usually required for entry, but some programs accept people without a diploma.

In 1998, approximately 1,100 State-approved programs provided practical nursing training. Almost 6 out of 10 students were enrolled in technical or vocational schools, while 3 out of 10 were in community and junior colleges. Others were in high schools, hospitals, and colleges and universities.

Most practical nursing programs last about 1 year and include both classroom study and supervised clinical practice (patient care). Classroom study covers basic nursing concepts and patient-care related subjects, including anatomy, physiology, medical-surgical nursing, pediatrics, obstetrics, psychiatric nursing, administration of drugs, nutrition, and first aid. Clinical practice is usually in a hospital, but sometimes includes other settings.

L.P.N.s should have a caring, sympathetic nature. They should be emotionally stable because work with the sick and injured can be stressful. As part of a health care team, they must be able to follow orders and work under close supervision.

Job Outlook
Employment of L.P.N.s is expected to grow as fast as the average for all occupations through 2008 in response to the long-term care needs of a rapidly growing population of very old people and to the general growth of health care. However, L.P.N.s seeking positions in hospitals may face competition, as the number of hospital jobs for L.P.N.s declines; the number of inpatients, with whom most L.P.N.s work, is not expected to increase much. As in most other occupations, replacement needs will be a major source of job openings.

Employment in nursing homes is expected to grow faster than the average. Nursing homes will offer the most new jobs for L.P.N.s as the number of aged and disabled persons in need of long-term care rises. In addition to caring for the aged, nursing homes will be called on to care for the increasing number of patients who have been released from the hospital and have not recovered enough to return home.

Much faster than average growth is expected in home health care services. This is in response to a growing number of older persons with functional disabilities, consumer preference for care in the home, and technological advances, which make it possible to bring increasingly complex treatments into the home.

An increasing proportion of sophisticated procedures, which once were performed only in hospitals, are being performed in

physicians' offices and clinics, including ambulatory surgicenters and emergency medical centers, thanks largely to advances in technology. As a result, employment is projected to grow much faster than average in these places as health care in general expands.

Earnings
Median annual earnings of licensed practical nurses were $26,940 in 1998. The middle 50 percent earned between $23,160 and $31,870 a year. The lowest 10 percent earned less than $20,210 and the highest 10 percent earned more than $37,540 a year. Median annual earnings in the industries employing the largest numbers of licensed practical nurses in 1997 were as follows:

Personnel supply services	$30,200
Home health care services	27,600
Hospitals	25,300
Nursing and personal care facilities	26,200
Offices and clinics of medical doctors	24,500

Related Occupations
L.P.N.s work closely with people while helping them. So do emergency medical technicians, social and human service assistants, surgical technologists, and teacher assistants.

Sources of Additional Information
For information about practical nursing, contact:
☛ National League for Nursing, 61 Broadway, New York, NY 10006. Internet: **http://www.nln.org**
☛ National Association for Practical Nurse Education and Service, Inc., 1400 Spring St., Suite 330, Silver Spring, MD 20910.

Nuclear Medicine Technologists

(O*NET 32914)

Significant Points

- Relatively few job openings will occur because the occupation is small.
- Technologists trained in both nuclear medicine and radiologic technology or other modalities will have the best prospects.

Nature of the Work
In nuclear medicine, radionuclides—unstable atoms that emit radiation spontaneously—are used to diagnose and treat disease. Radionuclides are purified and compounded like other drugs to form radiopharmaceuticals. Nuclear medicine technologists administer these radiopharmaceuticals to patients, then monitor the characteristics and functions of tissues or organs in which they localize. Abnormal areas show higher or lower concentrations of radioactivity than normal.

Nuclear medicine technologists operate cameras that detect and map the radioactive drug in the patient's body to create an image on photographic film or a computer monitor. Radiologic technologists also operate diagnostic imaging equipment, but their equipment creates an image by projecting an x ray through the patient. (See the statement on radiologic technologists elsewhere in the *Handbook*.)

Nuclear medicine technologists explain test procedures to patients. They prepare a dosage of the radiopharmaceutical and administer it by mouth, injection, or other means. When preparing radiopharmaceuticals, technologists adhere to safety standards that keep the radiation dose to workers and patients as low as possible.

Technologists position patients and start a gamma scintillation camera, or "scanner," which creates images of the distribution of a radiopharmaceutical as it localizes in and emits signals from the patient's body. Technologists produce the images on a computer screen or on film for a physician to interpret. Some nuclear medicine studies, such as cardiac function studies, are processed with the aid of a computer.

A nuclear medicine technologist prepares equipment for a full-body scan of a patient.

Nuclear medicine technologists also perform radioimmunoassay studies that assess the behavior of a radioactive substance inside the body. For example, technologists may add radioactive substances to blood or serum to determine levels of hormones or therapeutic drug content.

Technologists keep patient records and record the amount and type of radionuclides received, used, and disposed of.

Working Conditions
Nuclear medicine technologists generally work a 40-hour week. This may include evening or weekend hours in departments that operate on an extended schedule. Opportunities for part-time and shift work are also available. In addition, technologists in hospitals may have on-call duty on a rotational basis.

Because technologists are on their feet much of the day, and may lift or turn disabled patients, physical stamina is important.

Although there is potential for radiation exposure in this field, it is kept to a minimum by the use of shielded syringes, gloves, and other protective devices and adherence to strict radiation safety guidelines. Technologists also wear badges that measure radiation levels. Because of safety programs, however, badge measurements rarely exceed established safety levels.

Employment
Nuclear medicine technologists held about 14,000 jobs in 1998. About 8 out of 10 jobs were in hospitals. The rest were in physicians' offices and clinics, including imaging centers.

Training, Other Qualifications, and Advancement
Nuclear medicine technology programs range in length from 1 to 4 years and lead to a certificate, associate's degree, or bachelor's degree. Generally, certificate programs are offered in hospitals, associate programs in community colleges, and bachelor's programs in 4-year colleges and in universities. Courses cover physical sciences, the biological effects of radiation exposure, radiation protection and procedures, the use of radiopharmaceuticals, imaging techniques, and computer applications.

One-year certificate programs are for health professionals, especially radiologic technologists and ultrasound technologists, who wish to specialize in nuclear medicine. They also attract medical